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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/052,024	01/18/2002	Dawn A. Bonnell	UPN-4110	1230
7590	04/30/2004		EXAMINER	
Woodcock Washburn LLP One Liberty Place - 46th Floor Philadelphia, PA 19103			BENSON, WALTER	
			ART UNIT	PAPER NUMBER
			2858	

DATE MAILED: 04/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/052,024		BONNELL ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Walter Benson		2858	<i>W</i>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 February 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-7 and 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8,9,13 and 15 is/are rejected.
- 7) ☒ Claim(s) 10-12, 14, and 16-19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |
- W/Benson 571-272-2227*

**FINAL ACTION**

1. Amendment A, received on 2/19/04, has been entered into record.
2. Claims 1-20 are pending. Claims 1-7 and 20 stand withdrawn.

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 8, 9, 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hellemans et al. (US Patent No. 6,201,401 B1 and Hellemans hereinafter) in view of Adderton et al. (US Patent No. 6,530,266 B1 and Adderton hereinafter).

3. As to claim 8, Hellemans discloses a method for determining impedance information of an interface in a sample substantially as claimed, the method comprising:

applying an ac voltage to the sample, laterally across the interface, the ac voltage having a predetermined frequency (col. 7, lines 25-28 and col. 9, lines 20-24);

disposing a cantilevered tip in a first position proximate to a surface of the sample (12, Fig. 4; col. 7, lines 49-54);

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measuring a first response of the cantilevered tip with the cantilevered tip in the first position (col. 7, lines 54-58);

placing the cantilevered tip in a second position proximate to the surface of the sample, the interface being between the first position and the second position (col. 8, lines 1-9;

measuring a second response of the cantilevered tip with the cantilevered tip in the second position (Fig. 5; col. 8, lines 10-13);

Hellemans did not expressly disclose:

determining impedance information of the interface based upon the measured first response and the measured second response.

Nonetheless, these features are well known in the art and would have been an obvious modification of the system disclosed by Hellemans, as evidenced by Adderton.

In an analogous art, Adderton discloses an active probe for an Atomic Force Microscope having:

determining impedance information of the interface based upon the measured first response and the measured second response (col. 8, lines 20-35, 59-67 and col. 11, lines 54-60).

Given the teaching of Adderton, a person having ordinary skill in the art at the time of the invention would have readily recognized the desirability and advantages of modifying Hellemans by employing the well known or conventional features of image and position topography measurements, such as disclosed by Adderton, in order to detect changes in the oscillation amplitude of the cantilever tip indicative of a particular surface topography.

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4. As to claims 9, 13, and 15, Adderton discloses a method for determining impedance information of an interface in a sample, the method comprising:

measuring a first response comprises measuring a first phase angle of deflection of the cantilevered tip (col. 11, lines 59-67);

measuring a second response comprises measuring a second phase angle of deflection of the cantilevered tip (col. 11, lines 63-67);

determining impedance information comprises: determining a phase shift based upon the first phase angle and the second phase angle (col. 12, lines 47-49);

determining impedance information of the interface based upon the phase shift and the frequency of the ac voltage (col. 11, lines 56-62).

Given the teaching of Adderton, a person having ordinary skill in the art at the time of the invention would have readily recognized the desirability and advantages of modifying Hellemans by employing the well known or conventional features of image and position topography measurements, such as disclosed by Adderton, in order to realize high quality images at fast imaging speeds for a particular surface topography.

*Allowable Subject Matter*

5. Claims 10-12, 14, and 16-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record fails to teach or suggest individually or in combination a device and method for topographic processes where the step

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of determining impedance information further comprises determining an impedance product of the interface according to:

$$\tan(\varphi_{gb}) = \frac{\omega C_{gb} R_{gb}^2}{(R + R_{gb}) + R \omega^2 C_{gb}^2 R_{gb}^2}$$

where  $C_{gb}$  is the capacitance of the interface;

$R_{ab}$  is the resistance of the interface;

$\omega$  is the frequency of the ac voltage;

$\varphi_{gb}$  is the phase shift;

$R$  is a resistance of a current limiting resistor in series with the sample.

### *Response to Argument*

6. Applicant's arguments filed 2/19/04 have been fully considered but they are not persuasive.
7. In the remarks, applicant argues in substance that:
  - (1) Adderton does not determine the impedance of the sample interface.
8. Examiner respectfully traverses applicant's remarks:
  - a. As to point (1), see paragraphs above, Applicant's claimed invention does not support applicant's arguments. Claimed subject matter, not the specification, is the measure of the

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invention. Limitations in the specification cannot be read into the claims for the purpose of avoiding prior art. In re Self, 213USPQ 1, 5 (CCPA 1982); In re Priest, 199 USPQ 11, 15 (CCPA 1978). There is no “determine impedance of the sample interface” claimed in independent claim 8.

Furthermore, Adderton teaches determining impedance information of the interface based upon the measured first response and the measured second response (col. 8, lines 20-35, 59-67 and col. 11, lines 54-60).

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


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*Conclusion*


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter Benson whose telephone number is (571) 272-2227. The examiner can normally be reached on Mon to Fri 6:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on (571) 272-2233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Walter Benson   
Patent Examiner

April 28, 2004

  
**N. Le**  
**Supervisory Patent Examiner**  
**Technology Center 2800**